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Description

Data exchange system with a mobile component to control consumers

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The present invention relates to a data exchange system, in particular a mobile telephone system or home mobile telephone system according to the preamble of claim 1 for controlling devices or consumers.

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A system to control a multiplicity of electrical consumers is described in the publication WO 99/09780. These consumers are accessible via intermediate actuators by means of an IP address. Furthermore, the use of an interface to the Internet, whereby consumers can be controlled, is known from the publication EP 0 838 768 A2.

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The mobile telephone is being developed into a mass-market product. It is foreseeable that the mobile telephone will in future become a standard device in daily life.

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The CTS (Cellular Telephony System) is currently in the standardization phase. The CTS enables the use of a mobile telephone as a cordless telephone in the home on a home base station. The home base station serves as an interface between the mobile telephone and the fixed network and allows calls to be made from the mobile telephone via the fixed network.

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Furthermore, the use of mobile telephones for remote control purposes in the home is also currently under discussion. Integration of an infrared interface into mobile telephones is currently envisaged, so that

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different devices in the home can be controlled with the aid of a mobile telephone via infrared control signals. In this case, mobile telephones can be used in particular as remote controls with a learning
5 capability. However, the equipment of mobile telephones with an infrared interface is associated with the disadvantages that additional hardware outlay, an additional radiation line for the infrared LED and a direct line-of-sight contact between the corresponding
10 mobile telephone and the devices which are to be remotely controlled are required.

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In addition, applications are already known in which mobile telephones are used in the home to control consumers. Thus, for example, a data exchange system implemented on the basis of a home mobile radio system is known in which a mobile telephone operated according to the DECT standard (Digital European Cordless Telephone) is used to control a television set, which also contains the base station of the mobile radio system.

The object of the present invention is to provide a simple facility for controlling consumers via a mobile data exchange device, in particular via a mobile telephone.

This object is achieved according to the present invention by means of a data exchange system with the features of claim 1, which comprises a mobile component, in particular a mobile telephone. The subclaims define advantageous and preferred embodiments of the invention.

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The present invention is based on a data exchange system as described above, in which a mobile component is used to control a consumer. According to the invention, the control commands are transmitted from the mobile component via an Internet interface to a control device. The data exchange system may be designed in particular in the form of a home mobile radio system, so that a mobile telephone with an Internet interface is used as the mobile component.

Since plans already exist to equip high-end telephones with an Internet interface in the near future, no additional hardware is essentially required in a mobile telephone of this type for remote control of consumers. The invention offers the particular advantage that devices

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5 If a mobile telephone is used as the mobile component, this can be operated on a home base station as a cordless telephone. According to the invention, different consumers which are to be remotely controlled are connected to this home base station, so that, via
10 the home base station, remote control of these consumers is possible via any type of data connection.

Since the standard home base station is normally designed merely as a communications interface between the mobile telephone and a communications network, an additional control is required which, on the one hand, is controlled from the mobile telephone via the Internet interface of the mobile telephone and which, on the other hand, forwards the control commands accordingly via the data connection to the individual consumers or devices. The control therefore performs the function of a home server.

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25 The home base station may, for example, be based on the GSM standard (Global System for Mobile Communication) or the UMTS standard (Universal Mobile Telecommunication System) and the CTS standard.

Control of consumers via a mobile telephone furthermore
30 offers the advantage that a system for identification
and authentication of the user is already available for
mobile telephones, so that this system can also be used
for access restriction for various consumers or their
functions.

The present invention is explained below with reference to the drawing and a preferred embodiment, whereby it is assumed that the data exchange system according to

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the invention is designed in the form

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of a home mobile radio system. However, it must be noted that the invention can also be applied to other data exchange systems in which essentially any given mobile components can be used to control consumers.

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Fig. 1 shows a schematic block diagram of a preferred embodiment of the invention to explain the principle on which the invention is based.

10 Fig. 2 shows a representation to explain a hierarchical menu structure which can be used in the system shown in Fig. 1 to control various consumers, and

Fig. 3 shows a variation of the system structure shown
15 in Fig. 1.

Fig. 1 schematically shows a home mobile telephone system according to the present invention. This home mobile telephone system comprises a mobile telephone 1,
20 a home base station 2 which is connected via a connection or an interface 3 to a communications network, and a home server 4 which is connected to the home base station 2. The communications network may, in particular, be a fixed telephone network, a satellite
25 communications network, a radio network or, with the use of "power line technology", also a power network.

The home mobile telephone system is designed according to the CTS standard in such a way that, with the aid of
30 the home base station 2, a communications link can be set up between the mobile telephone 1 and the communications network. The home base station 2 therefore serves as a communications interface between the mobile telephone 1 and the communications network,
35 and enables the use of the mobile telephone 1 as a cordless telephone in the home.

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The home server 4 serves as a control device to convert control commands transmitted by the mobile telephone 1 into a corresponding control of various consumers 5. For this purpose, the consumers 5 are connected via a data transmission line or path 9 to the home server 4. This may involve not only wired data transmission but also wireless data transmission, e.g. infrared signal transmission.

10 . It is known that control commands can in principle be transmitted via the Internet (World Wide Web, WWW). Current Internet and Java developments are designed to network devices via the Internet and remotely control these devices with the aid of control commands transmitted via the Internet. It can be assumed that, in the near future, all high-end telephone devices will possess an Internet interface in order to access the Internet.

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20 In the embodiment shown in Fig. 1, the mobile telephone 1 is therefore also equipped with an Internet interface, so that the control commands to control various consumers are transmitted by the mobile telephone in an Internet-compatible format. The WAP standard (Wireless Application Protocol) in particular can be used for this purpose. The home server 4 connected to the home base station 2 is correspondingly equipped with a function to evaluate Internet control commands of this type in order to convert these Internet control commands into normal analog or digital control commands to control the various consumers. Via the home base station 2, normal Internet access is available via the fixed telephone network connection 3.

35 The consumers 5 connected to the data transmission path 9 may, in principle, involve any given home or office devices. Thus,

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infrared transmission. The use of dual-mode devices (e.g. DECT/GSM) is similarly conceivable. In addition, the control commands can also be transmitted from the mobile telephone to the home base station 2 or to the home server 4 connected thereto in a different frequency band and with a shorter range than in normal call data transfer.

The different consumers 5 can advantageously be controlled from the mobile telephone 1 via a hierarchical menu structure, as shown by way of example in Fig. 2. This menu structure may be implemented on the mobile telephone 1 or may be offered to the mobile telephone 1 by the home server 4. Once the user has selected the control menu, the first menu shown in Fig. 2, for example, is presented on a display unit 8 of the mobile telephone 1. With the aid of this menu, the user can, preferably via the keypad 7 or a different input medium, make a preselection concerning the device or consumer 5 which is to be controlled. If a television set (TV) has been selected as the device to be controlled, the second menu shown in Fig. 2, for example, is presented on the display unit 8, via which menu the required television program can be selected. Following the selection of a television program, a further menu can be presented, with which, for example, as shown in Fig. 2, the volume or brightness can be set, etc.

A particular advantage in the remote control of consumers 5 with the aid of a mobile telephone 1 is that a system for identifying and authenticating the user is already provided for mobile telephones. Thus, GSM mobile telephones 1 can only be operated with "SIM cards" 10 (Subscriber Identification Module), which are inserted into the mobile telephone 1 and which contain identification information relating to the relevant user which can subsequently be checked in order to

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release the mobile telephone 1 for the authorized user only. User authentication in the mobile telephones 1 is becoming increasingly reliable. Fingerprint recognition, for example, is also currently under
5 discussion. In addition, identification through voice recognition is also possible.

The abovementioned identification and authentication options for mobile telephones 1 can advantageously be
10 used in the context of the present invention in order to selectively release only specific consumers or devices 5 or corresponding functions of the consumers for the relevant user. If the present invention is used in the office domain, it is thus possible, for example,
15 following user identification, to determine whether this user, in controlling a personal computer, is even authorized to switch it on. If not, access is denied. Access authorization can be checked in both the mobile telephone 1 and the home base station 2 or in the home
20 server 4. Similarly, with the aid of the identification options of the mobile telephone 1, only specific functions of the relevant controlled device 5 can be protected against unauthorized access. Thus, for example, specific television programs can be released
25 in this way for specific users or can be blocked (e.g. for children).

Due to the increasing computing power of available computer components and increasing integration,
30 different system components can be functionally combined in one device. In particular, it is possible for the home server 4 and the home base station 2 to form one unit, as indicated in Fig. 3.

35 A unit of this type may internally comprise one or more control units (CPUs) 11, one or more memories 12 to store software and/or data, ancillary units

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e.g. MPEG decoders 13 and different interfaces 14, 15 for connection with other devices. These interfaces may, for example, be wire-based or wireless, or may support "power line technology". The use of dielectric
5 conductors, such as optical fibers, is also conceivable. The interface 15 provides a connection to the data transmission path 9.

The functionality of a combination unit of this type
10 may, for example, comprise the functionality of a television set. In this case, the combination unit receives a television program via one of the interfaces 14 (e.g. via a television cable connection) and converts these data with the aid of the MPEG decoder 13
15 into an image data stream. One of the controlled consumers 5 may be designed as a digital monitor which receives the image data from the combination unit via the data transmission path 9 which is designed as an IEEE1394 bus.
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20 In parallel with this television operation, processes run on the control unit(s) 11 which ensure wireless communication between the combination unit and the mobile component 1 shown in Fig. 1. The mobile unit 1
25 may serve as a further input/output unit for the processes of the combination unit. The data entered via the mobile component 1 may be transmitted via one of the connected interfaces 14, 15 of the combination unit to other data-processing devices or consumers 5.

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